

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TENNESSEE**

NATIONAL PARKS CONSERVATION)	
ASSOCIATION, INC., the SIERRA CLUB,)	
and OUR CHILDREN’S EARTH)	
FOUNDATION,)	
)	
Plaintiffs,)	Civil Action No. 3:01-CV-071
)	
v.)	(Judge Varlan)
)	(Magistrate Judge Guyton)
TENNESSEE VALLEY AUTHORITY,)	
)	
Defendant.)	
)	
_____)	

PLAINTIFFS’ CLOSING ARGUMENT

August 31, 2009

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I. INTRODUCTION

A common sense application of the evidence to the law in this case proves that the two projects at issue constituted a major modification. On the very day TVA began the two projects at Bull Run, TVA projected that the projects would lead to increased annual generation (and therefore increased annual emissions). Furthermore, TVA was unable to meet its burden of showing that projects that replaced over 78 miles of boiler tubing (over 25% of the boiler), took over eleven weeks to complete, cost more than the plant's entire average annual maintenance budget, and had never been performed in the twenty years of the unit's life (and in the case of the economizer, had never been performed in the entire TVA system) were "regular, customary, or standard" actions "undertak[en] for the purpose of maintaining the plant in its current condition." 1988 Clay Memo at 4-5 (DX54). In short, the projects were not routine maintenance. Similarly TVA was unable to show that from the time EPA approved the applicable PSD rule into the Tennessee SIP until the time the projects began, that EPA (or TDEC) ever indicated that the emissions increase test was anything other than annual or that the RMRR exception was anything other than a "very narrow exclusion." *Id.* at 3. In other words, TVA has no "fair notice" argument. Consequently, the Court should hold TVA liable for the violations alleged in the complaint.

II. EMISSIONS INCREASE

A. OVERVIEW

A "major modification" is:

[A]ny physical change or change in the method of operation of a major stationary source that ***would result in a significant net emissions increase*** of any pollutant subject to regulation under this Division 1200-3.

TAPCR § 1200-3-9-.01(4)(b)(2); *see also* Order on Summary Judgment, Doc. 170. at 12 (emphasis added). At the trial, the parties addressed two sub-issues arising from this definition. Would the projects *cause* an increase in the emissions of sulfur dioxide (“SO₂”) and nitrogen oxides (“NO_x”), and if so, would those increases be significant? Each issue is discussed below.

B. CAUSATION

1. TVA Undertook the Projects to Improve Availability and Expected that the Projects “Would Result in” Increased Annual Generation (and Therefore Increased Emissions).

Bull Run creates pollution (SO₂ and NO_x) by burning coal. Pretrial Order, Doc. 185 ¶ 8. If run at essentially full power (capacity), the more it operates, the more pollution it will emit. June 2, 2009 Transcript (hereinafter, “Doc. 203”) at 233-234. In 1988, Bull Run was TVA’s most efficient coal-fired plant. *Id.* at 29-31, indeed, one of the most efficient in the United States. Doc. 203 at 29-30. To take advantage of its efficiency, TVA ran Bull Run close to or at full power as much as it could. *Id.* at 30. TVA performed the economizer and superheater projects so that this efficient unit would be more available to operate. *Id.* at 217- 222. A by-product of this additional usage of the Bull Run plant is additional pollution. Consequently, performing the projects at issue caused emissions to increase on an annual basis. The causation issue is as simple as that.

At the trial, the plaintiffs explored the emissions increase issue with the assistance of Robert Koppe, one of the foremost experts in the nation in the study of availability from electric utility steam generating units such as Bull Run. *Id.* at 194-210; *see also* Resume of Robert H. Koppe (P-75). Mr. Koppe, a power plant engineer with a Masters Degree from Ohio State and post-graduate work at MIT, has been studying power plant availability issues since the mid-

1970's. *Id.* Mr. Koppe explained that in the mid-70's, utility unit operators became keenly interested in improving unit availability, *id.* at 196, and his ground-breaking work in the field since that time led to the creation, under his supervision, of the Generating Availability Data System ("GADS"), a data collection system operated by the North American Electric Reliability Corporation, to which almost all utilities in the United States, including TVA, report. *Id.* at 202-203. Mr. Koppe used this Bull Run GADS data to conduct his analysis in this case. *Id.* at 203. Mr. Koppe has done dozens of studies for the utility industry involving the same tasks and methodology he put to work here; namely, studying the expected improvements in availability that would result from large capital improvement projects. Doc. 203 at 203-204. Having worked for the utility industry, government, and non-governmental organizations, and given his long career working with these issues, Mr. Koppe is uniquely qualified to provide the Court with background and objective analysis on the issue of whether TVA should have expected these projects to lead to significant annual emissions increases.

Mr. Koppe explained the following key concepts that utilities use to analyze availability issues:

- "Capacity" or "Capability" – The measure of the amount of electricity a unit can generate at full power. Doc. 203 at 102-12; Doc. 204 at 22, 98.
- "Availability" – Every generating unit shuts down periodically for equipment overhauls and modifications and more regularly because of equipment failures. When a unit is shut down because of equipment work, it is not able to operate. When a unit is not able to operate and generate electricity, the unit is said to be "unavailable." The rest of the time

when it is not required to be shut down for equipment problems, a unit is said to be “available.” *Id.* at 190-191.

- “Forced Outage” – An unplanned outage due to an equipment failure. *Id.* at 237-238. *See also* Pretrial Order, Doc. 185 ¶ 26; June 1, 2009 Transcript (hereinafter, “Doc. 202”) at 91 (Mr. Hekking explaining that a “forced outage” is when a “generating unit is out of service because something is broken and the unit will not run.”).
- “Turndown” – TVA’s term for periods when a unit is operated at outputs lower than its capability even when it is available because there is not a need for all of the power the unit can produce.” Pretrial Order, Doc. 185 ¶ 81.
- “Utilization Factor” – Related to the concept of turndown, and is the measure of how much a utility uses a unit; that is to say, how much electricity a unit generates when it is available. If a utility always operates a unit at full power whenever it is available, then the unit’s utilization factor would be 100%. On the other hand, if a utility never used a unit when it was available, its utilization factor would be zero. Doc. 203 at 213-214.

As mentioned above, because TVA almost always ran Bull Run at full power, Bull Run’s utilization factor was between 96 to 99%. *Id.* at 215-216.¹ TVA maintained this level of utilization for Bull Run both before the projects and after. *Id.* at 217. This high utilization factor means that TVA essentially operated Bull Run every hour that it was available and had the Bull Run unit become available to operate an additional week per year, TVA would have operated the

¹ TVA’s expert Donald Houston determined that Bull Run’s utilization factor was 96%, July 7, 2009 Transcript (hereinafter, “Doc. 208”) at 177, and he did no analysis whether TVA had any expectation that Bull Run’s utilization would change from before to after the projects. July 8, 2009 Transcript (hereinafter, “Doc. 209”) at 12.

unit for that additional week, *id.* at 217-218, with concomitant increases in generation and emissions.

The evidence that TVA expected that the economizer and superheater projects would lead to availability improvement at Bull Run is overwhelming. First, plaintiffs point the Court to a document that is as close to a smoking gun as one will ever find in one of these cases, the 1988 Letter from C.N. Dammann (P-229). This exhibit shows performance goals established by the management of TVA's fossil operations for each of TVA's fossil plants, including Bull Run. TVA set these goals "considering the expected improvement in the projected forced-outage rate because of any reliability improvement projects to be completed in fiscal year 1988." 1988 Letter from C.N. Dammann at pdf p. 1 (P-229). The pages regarding Bull Run, at pdf 11-12, prepared at the commencement of the 1988 projects, show that TVA expected that the forced outage rate at Bull Run to decline after 1988 and expected electricity generation to increase. *Id.* at pdf 11. Furthermore, TVA went on to attribute these projections to three specific actions, the two projects at issue in this case and a turbine blade replacement project. *Id.* at pdf. p. 12. This document shows that TVA knew prior to the 1988 outage that the projects "would result in" increased generation (and therefore increased emissions).

Other evidence confirms that TVA knew the projects would result in availability increases. *See* the Work Order for the superheater project (P-129) (noting that "replacement of the [superheater] elements will reduce the number of forced outages [and] increase the availability and reliability of the unit"); the Work Order for the economizer project (DX18) ("the work will increase the reliability of the unit"); testimony from Mr. Hekking, Doc. 203 at 48 and at 60-61, 109-110, and Mr. Koppe, *id.* at 218, 221. Indeed, the evidence shows that one of

TVA's main purposes in undertaking the projects was to obtain this availability improvement, and TVA was willing to spend \$11.9 million, *id.* at 38, 61, to get it. Given the high utilization factor for Bull Run, it is inevitable that this expected improvement in availability would translate into increased annual generation and increased emissions.

2. TVA's Causation Arguments are Illogical and Contrary to Law.

TVA argues that because Bull Run could have operated during the baseline period with less turndown and less planned outage time, the projects could not have caused an emissions increase. Doc. 208 at 174-192. This argument is fundamentally flawed because it misinterprets the cause-in-fact or "but-for" causation test and because it misreads the Court's Order on Summary Judgment, Doc. 170.

(a) Cause in Fact

In the WEPCO rulemaking, EPA made clear in a section entitled "The Causation Requirement" that the "result in" language in the definition of major modification, TAPCR §1200-3-9-.01(4)(b)(2), is a causation test. *See* WEPCO Rulemaking, 57 Fed. Reg. 32314, 32326 (July 21, 1992) ("NSR will not apply unless EPA finds that there is a causal link between the proposed change and any post-change increase in emissions."). An article cited with approval by the Sixth Circuit explains how to analyze "but-for" causation properly. *See Powers v. Hamilton County Pub. Defender Comm'n*, 501 F.3d 592, 608 (6th Cir. 2007) (citing David W. Robertson, *The Common Sense of Cause in Fact*, 75 Tex. L. Rev. 1765 (1997)). The Robertson article describes the five-step test necessary to frame and answer but-for causation questions. The steps are:

- (1) identify the injuries in suit;

- (2) identify the wrongful conduct;
- (3) mentally correct the wrongful conduct to the extent necessary to make it lawful, leaving everything else the same;
- (4) ask whether the injuries would still have occurred had the defendant been acting correctly in that sense; and
- (5) answer the question.

Robertson, 75 Tex. L. Rev. at 1771.

With respect to the third step, Mr. Robertson cautions that only the defendant's wrongful conduct must be hypothetically changed:

The third step is the trickiest. It involves using the imagination to create a counterfactual hypothesis. One creates a mental picture of a situation identical to the actual facts of the case in all respects save one: the defendant's wrongful conduct is now "corrected" to the minimal extent necessary to make it conform to the law's requirements. It is important to stress that the mental operation performed at this third step must be careful, conservative, and modest; the hypothesis must be counterfactual only to the extent necessary to ask the but-for question. ***Only the defendant's wrongful conduct must be "changed," and that only to the extent necessary to make it conform to the requirements of law.*** The mental precision required here is a corollary of the step two requirement of "fixing as precisely as possible the piece of conduct - the exact act or omission - with which the defendant is charged." At step three, one mentally alters only that piece of conduct.

Id. at 1770-71 (citations omitted) (emphasis added).

Using this five-step process, one can precisely identify what is wrong with TVA's causation analysis. In step one, the injury is identified. Here, it is the increase in emissions. In step two, the wrongful conduct is identified: the superheater and economizer projects. In step three, one should assume only that the economizer and superheater projects had not been done and then ask, would the predicted emission increases have been the same even if those projects had not occurred? Instead, TVA made other assumptions to obtain its desired result, namely, the

assumptions that baseline emissions were different because of less turndown and less planned outage time. Mr. Robertson points out that courts have rejected this sort of speculation. *Id.* at n. 21 (citing *Boyer v. Johnson*, 360 So. 2d 1164, 1166-67 (La. 1978) (speculation beyond the facts of the case about whether the decedent could have died in another way was irrelevant in determining the true cause of death) and *Ford v. Trident Fisheries Co.*, 122 N.E. 389, 390 (Mass. 1919) (refusing to speculate whether an additional oar in the rescue boat - a hypothetical change of the facts - would have prevented the victim's death)). To do the “but for” causation test, it is simply impermissible for TVA to alter the causation timeline by assuming that baseline emissions could have been different, particularly since the emissions increase test requires that the baseline be determined by examining the pollution “*the unit actually emitted.*” TAPCR §1200-3-9-.01(4)(b)(22). Mr. Koppe’s analysis is consistent with Mr. Robertson’s approach because he acknowledged that although other independent factors would lead to emissions increases, they would not have led to as extensive an increase without the economizer and superheater projects. Doc. 204 at 39-40; Doc. 209 at 37-44.

(b) The Court’s Summary Judgment Order

TVA’s causation argument is also inconsistent with the Court’s Order on Summary Judgment, Doc. 170. In that Order, the Court stated:

The WEPCO Rule excludes “that portion of the unit’s emissions following the change *that could have been accommodated* during the representative baseline period *and* is attributable to an increase in projected capacity utilization *unrelated to the particular change*, including any increased utilization due to the rate of electricity demand growth for the utility system as a whole.” WEPCO Rule, 57 Fed. Reg. at 32,337 [See Doc. 129-95 at 26.] However, *if “it can be shown that the increase is related to the changes made to the unit, then emissions increases resulting from the increased operation must be attributed to the modification project.”* *New York*, 413 F.3d at 33.

Order on Summary Judgment, Doc. 170 at 29.

To carry out an analysis based on the Court's Order, one must identify all the post-project factors that could lead to increased emissions. Some of those increases include the accommodation of greater demand through less turndown, and if that increase could occur without the project, then it should not be "held against" the source. Mr. Koppe's testimony carefully went through each factor that could lead to post-project emissions increases, including (1) the projects themselves, (2) other projects that could also lead to increased availability, (3) less planned outage time, and (4) less turndown. June 3, 2009 Transcript (hereinafter, "Doc. 204") at 22-29. Mr. Koppe then showed that even if one assumes that all other possible causes were eliminated, the projects alone would cause an emissions increase. *Id.* at 12-66. In other words, Koppe's projection of future actual emissions shows that some of the overall projected increase would be attributable only to the projects, thereby meeting the causation test expressed in the Court's summary judgment order, Doc. 170.

In contrast, TVA did not even attempt to present a complete picture on this issue. They provided no projection of what post-project emissions would be, either in total or from the projects alone, and since they did not do that, of course they presented no evidence of what portion of post-project emissions would be attributable to the projects and what portion would be attributable to independent factors. On cross-examination, however, Donald Houston, TVA's expert acknowledged that if everything else remained the same, the projects would cause an emissions increase. Doc. 209 at 32-33. This acknowledgment completely undermines TVA's causation argument.

In their opening statement, plaintiffs explained that many of TVA's positions in this case defy common sense. TVA's position on causation is a perfect example. As Mr. Koppe explained, Doc. 204 at 32-33, if TVA could have simply generated the additional electricity it wanted from Bull Run by eliminating turndown and by reducing planned outage time, it would not have been prepared to spend almost \$12 million dollars on these two projects to obtain availability improvement. During its history, the Bull Run plant had been ranked by Electric Light & Power magazine as the most efficient coal-fired plant in the nation thirteen times. Pretrial Order, Doc. 185 at 14 ¶ 25. That is why its utilization factor was so high. Doc. 203 at 30-31. As one of its lowest cost performers, TVA wanted to run Bull Run as much as it could, yet review of the 1988 Letter from C.N. Dammann at pdf p. 11 (P-229) shows that because of forced outages, before the projects, Bull Run was unavailable over 20% of the time. TVA wanted to reduce that forced outage rate so it could use this efficient plant more often. Accordingly, it undertook the two projects at issue, as well as other projects, to achieve that goal. To now claim that this effort to increase annual generation from Bull Run would not lead to emission increases is simply disingenuous.

C. AMOUNT OF THE INCREASE

At this point, it is appropriate to take a step back and review what points TVA actually contested at trial regarding this issue, and what points it conceded. Although TVA asserted in its opening statement that Mr. Koppe's projections regarding emissions increase were based on an unreliable methodology, TVA's expert Mr. Houston neither challenged Mr. Koppe's methodology for determining projected availability improvement nor Mr. Koppe's methodology for translating those availability projections into projected emission increases. Since these points

are essentially uncontested, below plaintiffs review the evidence without belaboring the calculation issue.

1. The Actual-to-Future Actual Projection Test

Using the actual-to-future actual projection test, Mr. Koppe calculated the amount of emissions increase that TVA should have expected using as a baseline the two-year period immediately preceding the projects. Mr. Koppe explained that he performed this calculation two different ways, Doc. 204 at 33, using a simple approach and a more convoluted approach, one confirming the other. The more straightforward approach recognized that when it was operating, Bull Run emitted SO₂ at a rate of 5.26 tons per hour and NO_x at a rate of 2.14 tons per hour. *Id.* at 33-34. Mr. Koppe then multiplied these emission rates by the number of hours of availability improvement expected as a result of each project. *Id.* The following table summarizes his results, which show that either project, standing alone, would cause emissions increases over the significance threshold of 40 tons per year. TAPCR § 1200-3-9-.01(4)(b)(24).

PROJECTED EMISSIONS INCREASES USING THE ACTUAL-TO-FUTURE ACTUAL PROJECTION TEST AND THE TWO-YEARS IMMEDIATELY PRECEDING THE PROJECTS AS THE BASELINE (in Tons per Year) (Source: Doc. 204 at 34-36)		
Project	SO₂	NO_x
Superheater Project	386	157
Economizer Project	274	111

TVA's expert Donald Houston testified that a different baseline should be used for determining emissions increase in this case. As shown below, this argument is irrelevant because even using Mr. Houston's baseline, the projects would result in significant emissions increases.

TVA, however, is not entitled as a matter of law to use a different baseline because a different baseline can only be used if TDEC determines that another baseline would be “more representative of normal source operation.” TAPCR § 1200-3-9-.01(4)(b)(22). TVA never sought, and TDEC never made a determination on this issue. Doc. 209 at 24-25.

Furthermore, TVA’s arguments about whether another period would be more representative are inconsistent with EPA guidance. According to EPA, the situations when an alternate baseline can be used are “limited.” *See* Draft New Source Review Workshop Manual at pdf p. 58 (P-238).² To use a baseline period other than the two-year period immediately preceding a project, there must be a showing that “the prior 2 years is not representative of normal source operations,” and that the alternate period is “more representative.” *Id.* EPA went on to say that events that impact normal source operation include “catastrophic occurrences” such as “strikes or major industrial accidents.” *Id.* TVA made no showing that there were any catastrophic occurrences or that the alternate period it suggested was “more representative.” Indeed, if anything, the period 2-years prior to the projects was actually the most representative because the average level of emissions during that period was essentially the same as the longer 5-year average and because the period 2-years prior to the projects best represented the performance of the unit in the state it was in before the projects. Doc. 204 at 45-46.³

² The U.S. Supreme Court relied on this manual in *Alaska Department of Environmental Conservation v. EPA*, 540 U.S. 461, 475 and 497 (2004).

³ TVA’s expert, Donald Houston always selects the two-year period with the highest emissions as “most representative,” Doc. 209 at 15-16, a notion completely inconsistent with EPA’s guidance.

As mentioned above, however, even if the Court were to allow use of the alternative baseline, Mr. Koppe's uncontroverted conclusion (barring TVA's causation arguments, discredited above) is that the projects still would result in emissions increases:

PROJECTED EMISSIONS INCREASES USING THE ACTUAL-TO-FUTURE ACTUAL PROJECTION TEST AND DONALD HOUSTON'S PROPOSED BASELINE (in Tons per Year) (Source: Doc. 204 at 52-56)		
Project	SO₂	NO_x
Superheater Project	105	42
Economizer Project	404	164

2. The Actual-to-Potential Test

On the last day of trial, the Court revisited the portion of its Order on Summary Judgment that addressed the emissions increase issue and said it was inclined to apply the actual-to-future actual projection test and was "reluctant" to apply the actual-to-potential test. As the Court is aware, in their briefing on the cross-motions for summary judgment, plaintiffs explained why they believe the actual-to-potential test is the correct test. *See* Brief in Support of Plaintiffs' Motion for Summary Judgment on Liability, Doc. 136 at 24-27 and 44-51 and Plaintiffs' Reply Brief Regarding Plaintiffs' Motion for Summary Judgment, Doc. 146 at 3-4. Plaintiffs stand by those arguments, but will not repeat them here. Instead, plaintiffs point out that based upon the evidence presented, under either test, plaintiffs prevail. The following tables, based on TVA's interrogatory responses, show the increases that would result from the projects using the actual-to-potential test, using either baseline at issue.

PROJECTED EMISSIONS INCREASES USING THE ACTUAL-TO-POTENTIAL TEST AND THE TWO-YEARS IMMEDIATELY PRECEDING THE PROJECTS AS THE BASELINE (in Tons per Year) (Source: Interrogatory Numbers 6, 7,15, and 16 (P-3))			
Pollutant	Actual Emissions	Potential to Emit	Increase
SO ₂	33,647	144,890	+111,243
NO _x	15,895	23,101	+7206

PROJECTED EMISSIONS INCREASES USING ACTUAL-TO-POTENTIAL TEST AND DONALD HOUSTON'S PROPOSED BASELINE (in Tons per Year) (Source: Interrogatory Numbers 8, 9, 15, 16 (P-3))			
Pollutant	Actual Emissions	Potential to Emit	Increase
SO ₂	35,144	144,890	+109,746
NO _x	17,210	23,101	+5891

III. ROUTINE MAINTENANCE

Turning to TVA's first affirmative defense, TVA has failed to meet its burden of proof as to the applicability of the RMRR exception. *See* Order on Summary Judgment, Doc. 170 at 15.

In its Order on Summary Judgment, Doc. 170, the Court set out the applicable standard:

The Court will consider all of the WEPCO factors, including frequency, taking into consideration the work conducted at the particular . . . unit, the work conducted by others in the industry, and the work conducted at other individual units within the industry.

Id. at 18 (*citing United States v. E. Ky. Power Coop., Inc.*, 498 F. Supp. 2d 976, 993-94 (E.D. Ky. 2007)). Below, plaintiffs evaluate the evidence relevant to each of the WEPCO factors, and as it does so, plaintiffs stress two important points about the 1988 Clay Memo (DX54) where the WEPCO factors originated.

First, the Clay Memo stresses that the RMRR exception is to be narrowly construed:

The clear intent of the PSD regulations is to construe the term “physical change” ***very broadly***, to cover ***virtually any significant alteration*** to an existing plant. This wide reach is demonstrated by the ***very narrow*** exclusion provided in the regulations.”

1988 Clay Memo at 3 (DX54) (emphasis added).

Second, the 1988 Clay Memo provides guidance for distinguishing between what is routine and what is not. To pursue its argument, TVA has ignored this fundamental point and interpreted the four WEPCO factors out of context, attempting to turn the RMRR exception into a doctrine that exempts every major maintenance project and almost every economically justified major capital improvement project. Doc. 208 at 8 (Mr. Golden: “I’m not aware of any major maintenance projects that would not qualify as routine.”); *Id.* at 18-20 (only projects which Mr. Golden would definitely consider non-routine on their face would be ones that (1) resulted in an increase in hourly emissions, a test only applicable in the NSPS context, (2) that cost more than the 50% cost threshold for triggering NSPS reconstruction requirements or (3) involved the replacement of the foundation under a plant). As explained below, when the four WEPCO factors are applied to the undisputed facts of this case with appropriate fidelity shown to the definitions and analysis set forth in the Clay Memo, it is clear that TVA’s effort to prove the challenged projects are routine maintenance did not succeed.

A. Nature & Extent

EPA’s analysis of the Port Washington Projects in the Clay Memorandum provides ample guidance on how the “nature and extent” factor is meant to be applied in the context of a routine maintenance analysis. *See* 1988 Clay Memo at 4 ¶ (a) (DX54). This paragraph shows that in analyzing this factor, EPA simply looks at what the project is and, in a common sense way, determines whether the project is substantial or insignificant. *See Wis. Elec. Power Co. v. Reilly*

893 F.2d 901, 911 (7th Cir. 1990) (hereinafter *WEPCO*) (“first, the EPA observed that the nature and extent of the project was substantial”). This approach to “nature and extent” is consistent with the dictionary definition of “nature,” which is: “the essential character of a thing; quality or qualities that make something what it is; essence.” Webster’s Unabridged New Twentieth Century Dictionary, Second Edition (1986). Furthermore, the Clay Memorandum provides instruction as to the nature of routine maintenance, which it describes as “a regular, customary, or standard undertaking for the purpose of maintaining the plant in its present condition.” *See* 1988 Clay Memo at 4 ¶ (a) (DX54). Equipped with this guidance, one can compare the projects at issue with regular, customary, and standard activity at Bull Run and in the industry for maintaining power plants in their current condition to determine if the projects comfortably fit within a common sense understanding of “routine.” They do not.

Plaintiffs’ expert Mike Hekking explained the nature of regular, customary, and standard maintenance activities Bull Run and other coal fired power plants. Mr. Hekking explained that there are three basic categories of maintenance: (1) running maintenance, which involves a large number of relatively minor maintenance tasks that are performed on a regular, repetitive basis while a unit is in operation such as such as the calibration of instruments, Doc. 202 at 90-91; (2) forced outage maintenance, which is maintenance work which is performed during forced outages such as the repair of minor tube leaks, Doc. 202 at 91-102; and (3) scheduled outage maintenance, which is regularly scheduled maintenance tasks performed during planned outages such as opening, inspecting and repairing ducts, fans heaters, heat exchangers and tanks as well as less frequently performed scheduled maintenance on turbines or generators. Doc. 202 at 102-106; Doc. 203 at 114. Mr. Hekking noted that routine maintenance is normally approved at the

foreman or supervisor level and is accomplished within hours, days, or weeks rather than over a period of months. Doc. 203 at 111. Mr. Hekking also testified that routine maintenance is paid for out of a plant maintenance budget, Doc. 203 at 128-129; *see also* Doc. 203 at 108 (describing budgeting process for maintenance vs. capital project work). Hekking added that in-plant maintenance staff typically have the necessary skills, parts, and labor capacity to perform routine maintenance tasks. Doc. 203 at 111.

Viewed in context, one can see that the two projects at issue were major capital projects that have little similarity to regular maintenance activity. The economizer and secondary superheater projects were not activities performed under any standardized, pre-existing maintenance schedule. Doc. 203 at 115-116. They were “massive undertaking[s],” Doc. 203 at 111-112, well beyond the capabilities of the Bull Run maintenance staff to perform. Doc. 203 at 98. For this reason, TVA had to hire a large number of outside craftsman and laborers to complete these projects. Doc. 203 at 65- 86; Doc. 203 at 98. Before these projects were authorized, TVA had to obtain the approval of TVA’s Board of Directors, something that both Mr. Hekking and TVA former Chairman of the Board, David Freeman, confirmed would not have been necessary for routine maintenance tasks. Doc. 203 at 106-108; Plaintiffs’ Deposition Designations, Doc. 188 at 35. The planning for these projects took a number of years to complete, Doc. 203 at 66, and the management and oversight of the work was handled by TVA’s central offices instead of by the Bull Run Plant’s maintenance staff. Doc. 202 at 120; Doc. 203 at 37-39; Doc. 203 at 65-66.

The replacement of the Bull Run economizer involved removing approximately 67 miles of 2-inch tubing which weighed approximately 5 lbs per foot or 887 tons. Doc. 203 at 22; TVA’s

Responses to Plaintiffs' First Request for Admissions [Docket No. 136-11] ¶ 36 (P-4). That amount of material had to be ordered from an outside contractor, Babcock & Wilcox, who specially fabricated the material specifically for these jobs over a period of months, and then delivered it to the Bull Run Plant where it was installed. Doc. 203 at 66-67; Doc. 203 at 68-69. According to Mr. Hekking, the tubing material needed for this job alone would have filled 20 to 30 18-wheel flat bed trucks. Doc. 203 at 73. The tubing would have filled the courtroom where the case was tried from floor to ceiling and would probably have caused the floor in the courtroom to collapse due to the weight of the material involved. Doc. 203 at 73. Similarly, the secondary superheater project involved the removal and replacement of approximately 11 miles of tubing. Doc. 203 at 72. Together, this work represented the replacement of over a quarter of all of the tubing in the entire Bull Run unit. *See* TVA's Responses to Plaintiffs' First Request for Admissions [Docket No. 136-11] ¶ 38 (P-4); Pretrial Order, Doc. 185 ¶ 21 (boiler contains 300 miles of tubing).

To get this amount of old material out of the boiler and the new material re-installed required cutting a number of holes in the walls of the furnaces. Doc. 203 at 153. It also necessitated the use of cranes and the installation of an extensive rigging system, which is essentially specialized lifting equipment (*e.g.*, monorails) to assist in moving large and heavy material in and out of the boiler. Doc. 203 at 70-71. The project would have required from 60 to 100 boilermakers working rotating shifts, as well as numerous other craftsmen hired from local union halls. Doc. 203 at 81-82.

The outage during which this work in 1988 took place was approximately 15.3 weeks in length, which represented the longest outage that the Bull Run Plant has ever undergone. June 4, 2009 Transcript (hereinafter, "Doc. 201") at 54-55; *Id.* at 55-56. TVA has pointed out that only

11.6 weeks were spent on the economizer and secondary superheater projects. *Id.* at 55-56. The remaining outage appears to have been associated with an unanticipated failure of the turbine. *Id.* Nevertheless, 11.6 weeks represents a large amount of time to spend on two maintenance projects. Doc. 203 at 110-112. Regardless of whether the 1988 outage is treated as lasting 15.3 or 11.6 weeks, it remains longer than the average 8.2 week outage⁴ at Bull Run Plant. *See* Bull Run Planned Outage History (DX6).⁵

The secondary superheater project involved replacement of the inlet portion of the secondary superheater outlet pendant elements. During the 1988 project, TVA replaced T22 tubing with tubing made of TP347H. Pretrial Order, Doc. 185 ¶ 59. Not only was this not “routine” maintenance, it was not maintenance at all. It was a design change, implemented to substantially improve the performance the secondary superheater. Doc. 203 at 57. Furthermore, although plaintiffs are not seeking to address the 1986 secondary superheater work as a modification, the record is clear that before TVA undertook to replace the first third of the secondary superheater in 1986, it had already planned to replace the other two-thirds in 1988.

⁴ Unlike the 10 week average outage for Bull Run which Mr. Golden calculated, *see* Doc. 201 at 54-55, the 8.2 week figure is based on all the available outage data for Bull Run. *See* Bull Run Planned Outage History (DX6).

⁵ Unfortunately, the system-wide data on outages reported in Golden Table 3 - TVA Planned Outages (DX67) contains an error which undermines the reliability of all that data. For each year, starting at Week 4 and running down to Week 13, this table lays out in descending order the number of outages associated with each corresponding number of weeks. Therefore, after the entry for outages longer than four weeks, the entries for each year must reflect numbers which remain constant or decrease as one reads down each column. However, Golden Table 3 - TVA Planned Outages (DX67) reports that in 1987 there were 23 outages over 7 weeks within the TVA system and that there were 29 outages in the same year over 8 weeks, a mathematical impossibility.

Thus, it is more appropriate to consider the 1988 superheater project at issue here as the second phase of a complete secondary superheater replacement rather than as a partial replacement.

Doc. 203 at 48-58.

The two projects also fall outside the scope of normal operation and maintenance practices because of how they were budgeted – as capital projects instead of maintenance work. Mr. Hekking explained that capital improvement projects generally result in the improvement of the value of an asset or represent the addition of a new asset rather than simply maintaining the value of an existing asset, Doc. 203 at 108, and noted that TVA’s own capitalization policy reflected this same distinction between capital projects and maintenance. Doc. 202 at 115-117. Contrary to ordinary maintenance projects, capital improvement projects are paid for with funds earmarked for capital improvements and not out of plant-specific annual maintenance budgets. Doc. 202 at 112-115. Within the industry, there is a fairly uniform process for selecting, evaluating, approving, and implementing capital improvement projects which substantially differs from the processes applicable to routine maintenance activities. Doc. 202 at 108-109. For instance, approval for projects of the magnitude at issue here would have required high level management approval Doc. 202 at 120⁶ and would be accompanied by a cost-benefit analysis that was generally required to demonstrate a favorable economic justification for performing the project.⁷ Doc. 202 at 109-111.

⁶ As Combustion Engineering’s treatise “Combustion” states at pdf 2 (pg. 23 of the book) (P-18), “[m]ajor efforts to obtain higher availability and indefinite continuation of equipment life are in the area of upper management decision making beyond the proper activity of the maintenance-engineering staff.” Doc. 202 at 140-141.

⁷ Based on his knowledge and experience working within TVA, Mr. Hekking testified that except for projects concerned with safety or regulatory requirements, capital improvement

The distinction between major capital projects such as the ones at issue here and regular or “routine maintenance” as long been recognized by the industry and even TVA itself. In a document relied upon heavily by TVA, a 1975 paper discussing TVA’s life extension activity, the TVA authors stress that these types of projects are not routine maintenance. *See* Fox & Gladney 1972 Rpt at 2 (pdf 4) (DX41) (recognizing the distinction between “routine maintenance” which could be performed by the plant maintenance staff and what was termed “heavy maintenance,” which required TVA to bring in workers from the local labor market and from central TVA shops to supplement the regular plant maintenance staff.); Doc. 202 at 10-11. Similarly, in its learned treatise, Babcock & Wilcox uses separate chapters to distinguish between routine maintenance and capital improvement projects, noting that the latter are designed to improve availability and reliability and extend the life of coal-fired units, just as the challenged projects were. *See* Doc. 202 at 130-33 (“These replacements or repairs expand upon those traditionally incorporated in a plant maintenance program”) and at 136 (“Initially routine maintenance is sufficient to maintain high availability. However, as the unit matures and components wear, more significant steps become necessary to extend equipment life.”). A similar treatise by Combustion Engineering concurs. Doc. 202 at 138-141 (“Maintenance and repair activities beyond these three categories lead us into the realm of life continuation which is discussed in the next chapter. Major efforts to obtain higher availability and indefinite continuation of equipment life are in the area of upper management decision making beyond the proper activity of the maintenance-engineering staff.”)

projects would almost invariably have to result in an improvement in availability and reliability in order to be economically justified. Doc. 203 at 110-11.

Similarly, records from conferences organized by the Electric Power Research Institute (“EPRI”) reveal that before the WEPCO decision became a lightning rod issue, industry representatives were far less reticent to recognize the distinction between routine maintenance activities and major component replacement projects designed to improve availability and extend the life of coal-fired units. For example, in the 1985 EPRI Fossil Plant Life Extension Conference and Workshop at 2.1 (pdf p. 35) (P-159a), Duke Power stated:

As in the case with most U.S. utilities Duke Power Company has experienced a major change in operating philosophy in the last several years. In that time period decommissioning plans for certain fossil stations were scrapped and replaced with a change to continue operating them in primarily a cyclic mode for an extended period of time. ***This necessitated use developing a different approach than routine plant maintenance which would be responsive to the new schedule constraints. . . . Plant maintenance program previously employed did an excellent job in minimizing cost outlays versus keeping the plant in service until the end of its design life. This program simply can't be applied to the present situation.***

See also 1986 EPRI Life Extension and Assessment of Fossil Power Plants Conference Proceedings at pdf p. 92 (P-160a) (to evaluate options for units near 40-year useful life, Northern Indiana Public Service considered the following options: (1) retire the units at 40-years of age; (2) “operate the units as long as practical without making ***any major expenditures for extraordinary maintenance or capital improvements;***” or (3) extend the life of the plant through selective upgrades); at pdf p. 93 (“The analysis of inspection results yielded recommendations that eighteen of the thirty-seven balance of plant areas needed to receive attention ***in excess of routine maintenance*** if life was to be extended beyond the traditional 40-year value. . . . Distinguishing between equipment life and routine plant maintenance became a point of discussion during this prioritization process” and, in general, items with replacement costs exceeding \$100,000 and equipment driven by motors exceeding 250 horse power were included);

at pdf p. 97 (contrasting life extension work as being beyond routine maintenance and as necessary to extend component life beyond the traditional 40-year time period); at pdf p. 129 (stating that a life extension program “*augments an effective routine maintenance regime . . .*”); at pdf pp.115-116; at pdf p. 239 (recognizing that life extension work is beyond scope of routine maintenance); at pdf p. 245 (recognizing importance of distinguishing between life extension work and routine maintenance).

Recognizing that life extension projects were not comparable to traditional routine maintenance activities,⁸ some industry representatives as far back as 1985 began devising procedures designed to avoid the detection of life extension projects by regulators, encouraging utilities to pitch these projects as routine maintenance to local and state officials, not EPA, and to downplay the life extension aspects of this work by referring to such projects as “plant restoration (reliability/availability improvement).” 1985 EPRI Fossil Plant Life Extension Conference and Workshop at 27-1 (pdf p. 479), 27-3 (pdf p. 481) - 27-4 (pdf p. 482) (P-159a) .

These efforts were documented in a discussion group summary:

1. What is considered “routine” repair, replacement, or maintenance for the purpose of qualifying for an exemption to the NSPS modification provisions? ***Some aspects of life extension projects may not be considered routine repair/maintenance/replacement. To the extent***

⁸ Industry was well aware that life extension projects could trigger the application of PSD or NSPS requirements. 1985 EPRI Fossil Plant Life Extension Conference and Workshop at 10-3 (pdf p. 185) - 10-4 (pdf p. 186) (P-159a) (“***If a life extension project is determined to be a major modification or will otherwise be subject to PSD permit rules***, engineering studies of expected emission rates and control technologies must be performed, and mathematical modeling will be necessary to determine the expected impact of the increased emissions.”); at 10-11 (pdf p. 193) (“PSD (air) - If a Permit requirements apply to “major modification” - modification for which net emissions increase exceeds de minimis limits. (permit may be issued by state); at 27-3 (pdf p. 481) - 27-4 (pdf p. 482)

possible these projects should be identified as upgraded maintenance programs.

2. Where is the line drawn between capital versus maintenance expenditures?
...

Consensus Points

Following is a listing of points for which general consensus existed among the work group participants:

1. ***Life extension projects will result in increased regulatory agency sensitivity*** to facility retirement dates contained in generation expansion plans and used as the basis for rate case depreciation allowances. Regulatory agencies may contend that since life extension projects will defer the need for new generation, additional pollution control should be required for the older, higher emitting affected plants.
2. It may be appropriate to ***downplay*** the life extension aspects of these projects (and extended retirement dates) ***by referring to them as plant restoration (reliability/availability improvement) projects.*** To the extent possible, air quality regulatory issues associated with these projects should be dealt with ***at the state and local level and not elevated to the status of a national environmental issue.***
3. To the extent possible, ***project elements should be stressed as maintenance related activities to maximize chances for NSPS exemptions. Utility accounting practices play a significant role here.***

Id. at 27-4 (pdf p. 482).

These documents show that industry well understood the difference between routine maintenance and major capital improvement projects designed to improve availability. EPA has long found that this type of information – how industry itself classifies the work involved – extremely useful in the common sense determination of what is routine maintenance. 1988 Clay Memo at 3 (DX54); Detroit Edison Applicability Determination at 3-6 (P-232a).

In an effort to carry its burden of establishing that the two challenged projects were routine maintenance, TVA employed two contrivances to avoid reckoning with the overwhelming evidence on the nature and extent factor. First, in contrast to Plaintiffs, TVA avoided any practical, real-world comparison between activities it considered to be routine maintenance and those that it did not. Only reluctantly did Mr. Golden concede that any projects at a power plant could presumptively be deemed non-routine and all the examples provided were extreme and rare. Doc. 208 at 8, 18-20.

Second, TVA sought to redefine the nature factor in a manner that would open the RMRR door wide enough to treat the two large 1988 projects as routine. Specifically, Mr. Golden claimed that he found no guidance in either the 1988 Clay Memo (DX54) or any other EPA documentation for the meaning of the term “nature.” Doc. 201 at 36-37. Based on that incorrect contention, Mr. Golden argued that the term “nature” was synonymous with his definition of the term “routine,” which he defined as meaning “in accordance with a standard procedure.” *Id.* This approach is flawed. Because every project at TVA goes through a standard approval procedure, anything could be routine, including building an entirely new plant or making modifications that would result in an hourly emissions increase. Mr. Golden’s approach to routine maintenance can thus incorporate even the massive projects at issue here. Mr. Golden erred, however, because he failed to recognize that EPA spelled out that *routine* is: “a regular, customary, or standard undertaking for the purpose of maintaining the plant in its present condition.” 1988 Clay Memo at 4, ¶a (DX54). EPA came up with this formulation because in the Clay Memo, it was attempting to clarify the difference between what is routine and what is not. As the *Ohio Edison* court so aptly put it, “the regulation at issue does not exempt ‘*any*

maintenance, repair or replacement’ from compliance with the CAA -- rather, the regulation exempts ‘***routine*** maintenance, repair or replacement.’” *U.S. v. Ohio Edison*, 276 F. Supp. 2d. 829, 855 (S.D. Ohio 2003) (emphasis added). Mr. Golden disregards this critical distinction. The bottom line with respect to this factor is that the analysis must start with ***EPA’s*** conception of “nature and extent” and “routine,” not one made up by TVA, and then analyze the facts accordingly. Since the large-scale of these projects is undisputed, had TVA started its analysis with EPA’s conception, it would have had little or nothing to say, hence its effort to redefine basic terms to fit the undisputed facts.

B. Purpose

As just mentioned, in the 1988 Clay Memo, EPA articulates the purpose factor in a way to help distinguish between activities that should qualify for the routine maintenance exception and those that should not. EPA’s position – that the purpose of routine projects is to ensure that a plant and its various units are maintained in their “present condition” – is consistent with the narrow scope of the RMRR exception itself. 1988 Clay Memo at 3-4 (DX54) (starting on the last paragraph of p. 3). Conversely, if the purpose of the project is to improve the performance of a plant beyond its present condition, whether it be by improving availability, reliability, or by extending the life of the unit or its major components, that weighs against classifying the project as routine. *See id.* at 4, ¶a; *see also Ohio Edison*, 276 F. Supp. 2d at 835, 860-61 (purpose of routine maintenance is routine preventative care of components of units); *United States v. Cinergy Corp.*, 495 F. Supp. 2d 909, 935 (S.D. Ind. 2007); *Wis. Elec. Power Co.*, 893 F.2d at 911-12; *Sierra Club v. Morgan*, No. 07-C-251-S2007, U.S. Dist. LEXIS 82760 at *38-41, 44, 46 (W.D. Wis November 7, 2007).

In this instance, TVA expressly stated in its work order for the secondary superheater work that the purpose of that project was to “reduce the number of forced outages, increase the availability and reliability of the unit, and ... extend the life of this section of the boiler by approximately 20 years.” Doc. 203 at 218-219; Work Order to Replace Secondary S.H. Outlet Pendant Elements (Inlet Portion) (P-129); TVA’s Responses to Plaintiffs’ First Request for Admissions [Docket No. 136-11] at ¶20 (P-4) . Similarly, TVA’s work order for the economizer provided that the purpose of that project was to “increase the reliability of the unit and decrease maintenance costs.” Doc. 203 at 221-222; Economizer Work Order (DX 18); *see also* Doc. 201 at 35-37 (conceding both projects were performed for availability enhancement).⁹ Based on the work performed, Mr. Hekking confirmed that the economizer work was a life extension project. Doc. 203 at 13, 105-106. This evidence conclusively demonstrates that the purpose of these projects was to obtain an improvement in the condition, performance, and useful life of the affected components and the unit as a whole, which is at odds with the purpose of routine maintenance, repair and replacement. *See, e.g.*, Doc. 203 at 47-63.

In addition, the accounting treatment which TVA afforded to the economizer and secondary superheater projects also indicates that their purpose was not to keep the unit and the affected components in their present condition. *See generally* Doc. 203 at 108, 128-29; *Ohio Edison*, 276 F. Supp. 2d at 859-60; 1985 EPRI Fossil Plant Life Extension Conference and

⁹ TVA suggests that the improvements in availability and reliability that it was speaking of in the work orders were limited exclusively to “future anticipated” performance, Doc. 201 at 35-36. The 1988 Letter from C.N. Dammann (P-229) belies that contention, demonstrating that TVA knew when the projects were undertaken that it was suffering from ongoing availability problems attributable to the economizer and superheater and that TVA projected that Bull Run’s availability and reliability would be substantially improved from pre-project levels after the challenged projects were completed.

Workshop at 27-4 (pdf p. 482) (P-159a) (“***Where is the line drawn between capital versus maintenance expenditures?*** . . . “To the extent possible, project elements should be stressed as maintenance related activities to maximize chances for NSPS exemptions. ***Utility accounting practices play a significant role here.***”). Both general accounting principles for power plants and TVA’s own accounting rules draw a clear distinction between capital improvements and maintenance expenditures. *See* Doc. 202 at 107-08, 115-117, 119-20; TVA’s Capitalization Policy (P-50). By classifying both projects as capital projects, TVA was representing that they were intended to increase the value of the unit and affected components, thereby admitting that these projects’ purposes did not comport with the purpose associated with routine maintenance. The capitalization of these projects cannot credibly be dismissed as an irrelevant or arcane accounting convention. Doc. 201 at 60, 96. TVA made a definitive choice in the course of a fundamental business function to classify the two projects as capital projects and that choice has significant consequences. A straightforward and logical construction of the term “maintenance,” let alone “routine maintenance,” excludes from its scope any amounts defined as capital expenditures, *Ohio Edison*, 276 F. Supp. 2d at 860.

With such well-documented admissions, TVA was unable to reconcile its statements of purpose with the common sense definition of purpose articulated in the 1988 Clay Memo (DX54). Thus, as it did with the “nature and extent” factor, TVA directed its effort to redefining the purpose factor to fit the facts. To do this, TVA attempts to convert the purpose factor into the frequency factor. Mr. Golden freely conceded that both projects were performed for improvement in availability and/or reliability, but argued that such purposes are “very common . . . within the industry” and are entirely consistent with the purpose for a typical component

replacement. Doc. 201 at 35-36, 84-85. Therefore, according to TVA's tautological reasoning, if the purpose of the projects at issue is consistent with other projects that have been done in the industry, then the "purpose factor" weighs in favor of classifying the projects as routine. TVA's inquiry does not comport with the "purpose" of the purpose analysis, which is not to inquire whether the purpose of these projects is similar to other major capital projects, but rather whether the purpose is to *maintain* the present condition of the plant or *improve* that condition. Because the purpose of the projects was the latter, this factor weighs against classifying the projects as RMRR.

C. Frequency

Before addressing the specific evidence presented on the frequency factor, one threshold issue bears some attention. EPA issued the PSD regulations that underpin the relevant Tennessee SIP provisions on August 7, 1980. 45 Fed. Reg. 52676 (Aug. 7, 1980). Plaintiffs submit that the routine maintenance exemption was only intended to exempt those activities which EPA considered routine maintenance, repair and replacement as of that date.¹⁰

Turning to the evidence, TVA failed to prove that the projects were performed frequently at the Bull Run Plant, within the TVA system, or within the industry as a whole. In fact, as shown below, the evidence adduced at trial proves just the opposite. It is equally clear that in the instances where projects such as those at issue here are performed, they are not performed as part of a regular routine maintenance program according to any schedule or recommended intervals,

¹⁰ Although this is an important legal point, in this particular instance, it may make little difference whether frequency is evaluated as of 1980 or 1988 because, under either scenario, TVA has failed to prove that the challenged projects were performed anywhere or at any time with any meaningful frequency.

like the replacement of a timing belt in a car at a recommended 100,000 miles. Doc. 203 at 115-116.

The undisputed facts establish that the 1988 economizer replacement project at Bull Run was the first complete economizer replacement performed at the plant and indeed, in the entire TVA system. Doc. 203 at 105-106, 113, 186; Pretrial Order, Doc. 185 at 18, ¶48, 22, ¶71; Doc. 208 at 52-62. Prior to 1988, TVA's records indicate that only three partial replacements of economizers had ever been performed, all at TVA's Widows Creek Plant in 1979. *Id.* Since the extent of those projects is unknown, it is impossible to determine whether they were at all comparable to the 1988 economizer replacement at Bull Run. Doc. 208 at 52-62.

After 1988, TVA did perform additional replacement work on economizers within its system. For instance, in 2006, TVA again replaced the Bull Run economizer after another 18 years had passed. Doc. 203 at 105; Doc. 208 at 50. TVA also engaged in some degree of economizer replacement work at seven other TVA plants. Doc. 208 at 54.¹¹ However, none of those projects performed after 1988 are relevant to the frequency analysis because all this work took place after the Bull Run economizer was replaced. Even if the all the data Mr. Golden presented is considered, it shows only that through 2000, out of 59 units, TVA had replaced only 12 economizers, and 4 of those replacements were partial. This equates to an average of one economizer replacement every 255 unit years.¹²

¹¹ One of those projects was performed in 1996 at the Paradise Unit 1, which was a 750MW unit. Because TVA capital project records reflect that this only cost \$124,976, it appears to have been a partial economizer replacement. Cap Projects Greater than \$100K at 37 (DX60) .

¹² The average age of TVA's units, excluding those as Watts Bar, which were formally retired, Golden 2000 Rpt at 11 (DX37), can be roughly calculated by referencing the 1983

With regard to the superheater project, the story is much the same. This project represented the first time in the history of the Bull Run Plant that the secondary superheater outlet pendants had been replaced. Doc. 203 at 97-98; Pretrial Order, Doc. 185 at 71. The problems associated with the original secondary superheater can be traced back to a design flaw, Doc. 203 at 48-49; in this instance, the selection of the an inferior metal alloy used in the original tubing which ended up being insufficient to withstand the extreme temperatures it was subjected to. *Id.*; *see also* Doc. 204 at 157-58. Finally, TVA has again presented no evidence suggesting that the secondary superheater project was performed according to a standardized schedule of maintenance.

Through Mr. Golden, TVA did present some information reflecting some type of superheater replacement work performed within its system. Mr. Golden cited to a survey of TVA projects, which, according to him, revealed 123 either partial or complete superheater replacement projects performed within the TVA system. Doc. 201 at 77. He did not provide specific information about the time frame encompassing this data, *see id.* at 77, but presumably this data was derived from records generated sometime between the early 1950s, when the oldest remaining plants in TVA's fleet began operation, and the year 2000 when he completed his 2000 report on routine maintenance. *See id.* at 69. If taken completely at face value, this data does not demonstrate any significant level of frequency.

More significantly, Mr. Golden and TVA failed to provide sufficient details about this alleged work for it to be given any meaningful weight in making a frequency determination. For

Project Retirement Plan at 68-69 (DX44). From that, one can multiply the average age of 52 years by 59 units and divide the result by 12 economizer replacements to derive the frequency of economizer replacement projects per unit year at TVA. ($59 \times 52 = 2832$, $2832 \div 12 = 255.6666$).

example, TVA failed to show how many secondary superheater projects in the TVA system-wide data set were performed prior to 1980 or 1988. Doc. 208 at 80, 78, 79; *see also* Doc. 201 at 77-78 and Superheater Replacement by Ages (DX38). Therefore, it is impossible from what TVA presented as evidence to know how many of the reported activities have any relevance to the frequency determination in question. And equally important, Mr. Golden did not provide sufficient details about the scope and extent of the superheater work reported to make any kind of reasoned judgment about whether the activities reflected in his data were similar to the 1988 secondary superheater project. For instance, he did not know which projects, if any, were complete replacements and which were partial replacements, Doc. 208 at 78-79, and he did know how many of these projects he had reported reflected projects smaller than the replacement of an outlet pendant section. *Id.* at 79.¹³ For all these reasons, the TVA system-wide data on superheaters cannot be afforded any meaningful weight in evaluating the frequency factor.

As far as similar replacement work within the industry is concerned, plaintiffs' expert, Mr. Hekking, conceded that numbers of economizer and superheater replacements had been performed in the industry. Doc. 203 at 143-47. However, such projects are nonetheless rare events and are not performed with any frequency or regularity. Doc. 203 at 119-20, 125. Mr. Hekking testified that an economizer typically lasts approximately 40 years before replacement might be considered, and concluded that "[s]omething that is done every 20, 30, 40 years, if ever,

¹³ Although TVA's 1983 Retirement Plan Report at 74-75 (pdf 77-78) (DX44) reflects 18 superheater replacement jobs being done on the TVA system as of 1979, there is no data available to explain what the extent and scope of those jobs were and whether they involved something as significant as the replacement of the secondary superheater outlet pendants. See generally Doc. 208 at 63. For that reason, this evidence is not entitled to any meaningful weight in the frequency analysis.

I cannot reasonably say that is a frequent occurrence.” Doc. 203 at 119-20.¹⁴ Other than the Bull Run Plant, Mr. Hekking could not identify another coal-fired unit in the entire country where an economizer had been replaced more than once in the life of the unit. Doc. 203 at 116-117.¹⁵ With regard to superheater replacements, Mr. Hekking testified that where older coal-fired plants across the industry were at or near the end of their useful life and their owners made a decision to continue operating them for another 10, 20, or 30 years, then he did expect to find that those plants had either already replaced their superheater or that such a project was anticipated in the future. Doc. 203 at 149. However, as with an economizer, the fact that some unknown portion of older plants may perform a superheater replacement once or twice in the life of a unit, perhaps every 20, 30, or 40 years, does not by any stretch make that activity a frequent occurrence. Doc. 203 at 147-148.

Through the testimony of its routine maintenance expert, Mr. Golden, TVA attempted to present some additional evidence on economizer and superheater replacement projects that have allegedly occurred at other units operated by other utilities. Doc. 208 at 44-80.¹⁶ However, the

¹⁴ Mr. Hekking freely conceded that certain projects at coal-plants are performed at fairly long intervals, such as regularly scheduled turbine maintenance, which is typically conducted once every 5 to 7 years. Doc. 203. at 114. And he does generally consider turbine maintenance to be routine. Doc. 203. at 156. However, that 5 to 7 year interval for performance at a unit represents “the extreme end of what [Mr. Hekking] would consider routine in the context of frequency.” *Id.*

¹⁵ TVA and Mr. Golden, likewise, failed to identify any other instance where this has occurred. Doc. 204 at 112-250; Doc. 201 at 1-102; Doc. 208 at 1-92.

¹⁶ In TVA’s opening statement, TVA’s counsel downplayed the extent to which TVA would rely on this survey data to attempt to prove that the projects in question were performed frequently within the industry. Doc. 202 at 24. As it ended up, this was virtually the only piece of quantified information on frequency in the industry that TVA had, and it was clearly relied on heavily by TVA despite its obvious flaws.

only quantifiable evidence to support this testimony is derived from an inherently flawed survey that included TVA and four other utilities. Doc. 208 at 69. There are a host of flaws with that survey, most of which were touched on during Mr. Golden's cross-examination. Doc. 208 at 44-80. Some of the more important issues that bear on the proper weight to be afforded to this evidence are discussed briefly below.

First, as TVA's counsel appears to have recognized, Doc. 204 at 66, Mr. Golden's survey was not statistically valid for several reasons. Doc. 208 at 44-80. The survey only collected data from four other utilities in addition to TVA, Doc. 208 at 69, and each of those other utilities had either received a notice of violation or at least a Clean Air Act Section 114 information request. *Id.* at 20-22. Therefore, all the participants in Mr. Golden's survey understood that (1) they were facing a government Clean Air Act enforcement action, *id.*, and (2) that the more replacement work reported, the more helpful Mr. Golden's survey would be to each of the participants' defense of such an enforcement action. Doc. 208 at 70-71. This is the very definition of a biased survey sample, and, more significantly, since it was drawn exclusively from alleged Clean Air Act violators, it was patently unrepresentative. *Pittsburgh Press Club v. United States*, 579 F.2d 751, 758 (3d Cir. 1978).

Second, Mr. Golden was not personally involved in gathering the information reported from the other four participating utilities. Doc. 208 at 65. Instead, that work was conducted by Hunton & Williams' attorneys¹⁷ who interacted with the reporting utilities, "camouflaged" the

¹⁷ See generally *Pittsburgh Press Club*, 579 F.2d at 758 (refusing admission of survey facilitated by lawyers specifically for litigation purposes).

data,¹⁸ and provided it to Mr. Golden who proceeded to report it as his own report. Doc. 208. at 42, 66, 71-80. Because of the structure of this process, Mr. Golden has no idea what discussions might have occurred between Hunton & Williams and the participating utilities about any potential screening of data and whether to report smaller, less comparable projects. Doc. 208 at 66-67. Additionally, because Mr. Golden placed no clear parameters on what was to be reported – he simply requested all economizer and superheater capital projects costing over \$100,000 which were performed during a planned outage, Doc. 208 at 71-72; Doc. 201 at 69, 77. Mr. Golden might not have been privy to discussions about whether to report a series of phased replacement projects as one large single project or multiple ones, which could have significantly skewed the data reported. Doc. 208 at 44-80.

Third, because Mr. Golden's request for data encompassed both complete and partial replacement work and the underlying information was "blinded" before delivery to Mr. Golden, the data Mr. Golden reported for economizer and superheater replacements cannot be meaningfully compared to the challenged projects to determine how similar they were to the challenged projects. Doc. 208 at 66. For instance, Mr. Golden could not provide the number of reported economizer projects which were complete as opposed to partial replacements. Doc. 208 at 71-72. Furthermore, Mr. Golden could not tell the Court how many of the reported superheater projects involved full replacements as opposed to partial replacements, or, more

¹⁸ Because the complete set of underlying data collected by Hunton & Williams has never been produced to Plaintiffs, or even to Mr. Golden himself, *but see* Doc. 208 at 77 (Mr. Golden was shown one small component of the data by Southern Company which TVA failed to produce in discovery), there is no way for Plaintiffs to verify that the data reported by Mr. Golden was accurate. Doc. 208 at 79-80; *United States v. 478.34 Acres of Land, Tract No. 400*, 578 F.2d 156, 159 (6th Cir. 1978) (statistical survey was inadmissible because there was no way to test accuracy or reliability of the data).

significantly, how many of the reported superheater projects involved the replacement of a portion of a superheater which was substantially smaller in scope than the outlet pendant section which was replaced at Bull Run. *Id.* at 78-79; *see also 478.34 Acres of Land*, 578 F.2d at 159 (statistical survey was inadmissible because there was no way to test accuracy or reliability of the data and no effort to show that the unidentified properties covered by survey were comparable to the parcel of land at issue).

Fourth, because the survey lacked temporal bounds and was blinded, Mr. Golden could not tell the Court how many economizer or superheater replacements reflected in the survey data occurred prior to August 7, 1980, the date the federal PSD rules were promulgated, or March 11, 1988, the date that the work on the challenged projects commenced. Doc. 208 at 74. Thus, as discussed previously, there is no way for anyone, including TVA or Mr. Hekking, to confirm whether any of the replacement activities reflected in the survey are relevant at all to the evaluation of the frequency factor for the challenged projects.

Because of these four major flaws in Mr. Golden's survey of replacement activities at other utilities, the data that he has reported is inherently unreliable and misleading. Therefore, the Court should refrain from giving any weight to that data or to opinions based upon it in evaluating the evidence presented on the frequency in the industry issue. As was shown with regard to activities conducted at the Bull Run Plant and within the TVA system, the evidence presented fails to prove that the types of projects being challenged here have ever been performed with any level of frequency in the industry as a whole.

In sum, for all the reasons discussed above and as the evidence presented at trial further demonstrates, this factor weighs against finding that the projects were routine maintenance.

D. Cost

As with the other factors, the dispute between the parties is not about the facts, but rather what to make of them. The undisputed facts reveal that TVA anticipated that the capital costs of the projects would be \$8.8 million for the economizer and \$3.1 million for the superheater. Economizer Work Order at 1 (DX18); Doc. 203 at 44, 61; Work Order to Replace Secondary S.H. Outlet Pendant Elements (Inlet Portion) (P-129). Ultimately, TVA was able to save some money associated with the implementation of both these projects and so, after the work was completed, the final costs were \$6.45 million for the economizer and \$1.85 million for the superheater. Doc. 203 at 88-9, 104. These costs are high, regardless of whether one is assessing the higher pre-project cost estimate or the lower post-project actual capital costs. However, Plaintiffs submit that the most appropriate cost figures to evaluate are the pre-project estimates because in performing a retrospective routine maintenance determination one should rely on the same information that would have been available to the source immediately prior to the project at issue. Doc. 203 at 104.

Consistent with the 1988 Clay Memo at 6 ¶ d (DX54) , the evidence Plaintiffs presented on the cost factor demonstrated the magnitude of the costs in absolute and relative terms. Doc.203 at 123. In absolute terms, Hekking, confirmed the costs of the two projects represented “a massive amount of money,” *id.* at 121, a conclusion Mr. Golden did not challenge; *see also* 1975 Fussell Letter (DX7) (admitting that if economizer replacement becomes necessary, it will be a “major expensive replacement”) Doc. 203 at 112-13.

Mr. Hekking testified that within TVA, routine or normal maintenance tasks are paid out of a plant’s maintenance budget, not out of TVA’s capital additions and improvements budget,

and they typically cost in the hundreds to thousands of dollars, not millions. Doc. 203 at 120-121, 128-29. As an example of a typical or ordinary maintenance task, Mr. Hekking evaluated the repair of a single tube leak repair, (something Mr. Golden has personally observed only once in his entire career.) Doc. 208 at 22-23. Mr. Hekking noted that the repair would take a few hours and cost around \$1,000 dollars, Doc. 202 at 102, a far cry from the millions TVA was prepared to spend on these projects.

To provide the Court with context and perspective, Plaintiffs compared the projects' costs to the annual maintenance budgets for Bull Run for the 8 years prior to the project. *See* Doc. 203 at 99-100, 104, 108, 120-123; Pretrial Order, Doc. 185 at ¶¶ 36-43. Using the lower actual cost figure for the projects, that comparison revealed that the combined cost of the two projects was approximately \$8.3M, which exceeds what TVA spent for all plant-wide maintenance activities at Bull Run during fiscal years 1980, 1981, 1982, 1983 and 1986. Doc. 203 at 99-100; Pretrial Order, Doc. 185 at ¶¶ 36-43. In fiscal years 1984, 1985 and 1987, the total plant-wide annual maintenance costs expended at Bull Run were only marginally higher than the costs for those two projects. *Id.* When one uses the estimated cost figure for the two projects together of \$11.4M for this comparison, the cost exceeds even the highest annual maintenance budget. Doc. 203 at 61-62.

Even when the costs associated with these two projects are evaluated independently as stand alone projects, the costs associated with each of them remain very substantial when compared to the annual maintenance budgets for the Bull Run Plant. The \$6.4M in actual costs for the economizer represented a "a massive amount of money" and approaches what it typically cost at during the 1980s to maintain Bull Run for an entire year. Doc. 203 at 121. The \$8.8M in

projected costs would have equated with roughly 80% of annual maintenance expenditures for the Bull Run plant in 1987, the highest annual maintenance value evaluated. Doc. 203 at 45. A project of this magnitude could not have been paid for out of Bull Run's maintenance budget without the plant foregoing critical equipment maintenance activity. Doc. 203 at 122. Similarly, the \$1.8M in actual cost of the superheater project represents a "huge chunk of money to spend on one activity," roughly 25% of Bull Run's annual maintenance budget. Doc. 203 at 121. Using the Bull Run annual maintenance budget to fund that project would have consumed money needed to pay for thousands of other necessary maintenance tasks. *Id.* at 122-23.

The comparison between the project costs and the 8 years of annual maintenance budgets preceding the 1988 outage is the best available metric for evaluating the relative magnitude of the project costs because this comparison juxtaposes project cost with the cost of regular and ordinary maintenance work. This comparison comports with Mr. Hekking's substantial experience and knowledge of the industry, Doc. 203 at 122, and was adopted in *Cinergy* and *Morgan*. *Cinergy* 495 F. Supp. 2d at 932-33, 937, 939, 943, 947 (among other things, court held that a project which consumed slightly less than one third of the annual maintenance budget in 1996 was non-routine for that reason); *Morgan*, No. 07-C-251-S, 2007 U.S. Dist. LEXIS 82760, at *4-5, *37, *42.

In attempting to overcome this cost evidence and satisfy its burden of proof, TVA ignores relevant case law and points to a series of comparisons and data which are, when carefully evaluated, misleading and irrelevant.¹⁹ First, TVA provides a comparison of the cost of

¹⁹ One example of a misleading metric relied on by TVA is the comparison TVA makes between the dollars per kilowatt cost of the projects as compared to the U.S. Department of Energy's ("DOE") \$250/kW cost estimate for life extension programs. Doc. 204 at 206-207,

the project to the total replacement cost of the Bull Run Plant, Doc. 208 at 10, which is a factor EPA considered in evaluating the WEPCO Port Washington projects. 1988 Clay Memo at 6 ¶ (II)(A)(1)(d) (DX54). However, TVA places more emphasis on the fact that the costs of the challenged projects are less than the costs of replacing the entire plant than is warranted. As the Court in *Cinergy* pointed out:

[T]he fact that a repair or replacement project cost less than building a new facility is not surprising; if it were more expensive, Cinergy would have opted to build new facilities. Indeed, common sense suggests that cost savings is one of the reasons for doing a life extension or replacement project in the first place.

If this comparison were of paramount importance, then EPA would not have concluded in the 1989 Clay Memo at 7 (pdf 8) (P-234) that the \$500,000 air heater proposed for replacement at Port Washington was, standing alone, not considered routine maintenance. *See also* 1988 Clay Memo at 5 (DX54) (recognizing independent nature of other projects performed at Port Washington, including air heater replacements).

TVA relied on two other so-called “benchmarks” for assessing the costs of the challenged projects. These benchmarks were the costs in dollars per kilowatt associated with all the projects proposed at WEPCO’s Port Washington Plant and at Cinergy’s Beckjord Units 2 and 3. Doc. 208 at 24-27. As explained below, Mr. Golden’s dollars per kilowatt figures are not useful in evaluating the challenged projects’ costs or otherwise in drawing a line between routine

233- 235, 245-247; Doc. 208 at 27-44. U. S. Department of Energy’s Energy Conservation Technical Information Guide at 3 (DX163). A review of the DOE’s Technical Information Guide at 3-4 and Figure 2.1 (DX163) reveals that DOE’s \$250/kW estimate is based on the application of a complete life extension program designed to upgrade aging plants, which necessarily contemplates the performance of a number of major projects beyond that of routine maintenance, as well as other life extension-related activities. As such, that value cannot be used in any reliable fashion to individually assess the relative cost of the two capital improvement projects at issue here.

maintenance and non-routine activities. First, all these projects have been determined by federal courts and EPA ***not to be routine maintenance***. *WEPCO*, 893 F.2d 901 at 910-913; 1988 Clay Memo at 12 (DX54); *Cinergy*, 495 F. Supp. 2d at 933-937.²⁰ Second, the costs associated with each one of these projects are extraordinarily large,²¹ in part, because they were each determined by aggregating many different projects together. 1988 Clay Memo at 4, 6 n.3(DX54);²² *Cinergy*, 495 F. Supp. 2d at 933 (Beckjord Unit 3 project involved modifications or replacements of 49 different components), at 934 (Beckjord Unit 2 involved numerous components). For these reasons, showing that the Bull Run projects cost less in terms of dollars per kilowatts than these other projects do not make it more likely that the Bull Run projects are routine maintenance. All

²⁰ TVA contends that because EPA made a statement to Congressman Dingell in the 1989 Dingell Letter at 2, 4 (DX56) that it found no violations at Beckjord Units 2 and 3, TVA is justified in treating that letter as determining that those Beckjord projects constituted routine maintenance. Doc. 201 at 85-86; Doc. 208 at 24-27. This conclusion is unwarranted. First, there has been no evidence presented to show that EPA engaged in a routine maintenance evaluation at all. 1989 Dingell Letter at 2 (DX56) (“EPA conducted an informal telephone survey The survey did not result in the detection of any violations. Regarding the Duke Power (Beckjord)...we are determining of [PSD/NSR] permit applications were required.”) Moreover, if EPA did such an analysis, there no evidence to show what cost information it may have had at the time. *Id.* And whatever was the basis for the 1989 Dingell letter (DX56), EPA, at this point, by filing their case and establishing that these Beckjord projects were not routine maintenance, has made it abundantly clear that the projects at the Beckjord units are not examples of routine maintenance.

²¹ The capital costs for the Port Washington project were over \$45.6 million, 1988 Clay Memo at 6, n. 3 (DX54), and the costs for the projects at Beckjord Units 1-3 ranged from \$15 to \$20 million. *Cinergy*, 495 F. Supp. 2d at 936-37.

²² The Port Washington project involved, *inter alia*, 4 reheater replacement projects on 4 different units, 4 steam drum replacements on 4 different units, and an economizer replacement. 1988 Clay Memo at 4 (DX54); WEPCO Letter to Wisconsin PUC at Ex. A (P-230a); WEPCO Cost Doc (P-231) (showing \$1M economizer replacement).

that demonstrates is that the Bull Run projects are not at the very highest end of the range of non-routine costs.

As the courts in both *Ohio Edison* and *SIGECO* have concluded:

[N]othing in WEPCO suggests that any project smaller than WEPCO will automatically qualify as routine maintenance, or that WEPCO was some type of baseline for companies to compare its projects to in efforts to determine if they would qualify for routine maintenance. Rather, WEPCO was an easy case on routine maintenance -- the EPA and the Seventh Circuit quickly disposed of the defendant's arguments that it qualified for routine maintenance. . . . WEPCO is significant because it expresses the EPA's interpretation of routine maintenance and illustrates how the EPA applies it to a particular project. But comparing the nature of the WEPCO project to SIGECO's projects to suggest that SIGECO did not have fair notice of the EPA's interpretation of routine maintenance is unpersuasive because the EPA never indicated that WEPCO was a measuring stick for routine maintenance.

Ohio Edison, 276 F. Supp. 2d at 860 (citing *United States v. Southern Indiana Gas & Electric Company*, 245 F.Supp.2d 994, 1017 (S.D. Ind. 2003)). This logic applies with equal force to TVA's Beckjord benchmarks. Like the situation at Port Washington, the Beckjord projects were massive and the costs for many component replacements were aggregated into one cost larger number associated with each unit. For this reason, the Beckjord projects represent the very high end of the non-routine cost scale. However, because there is no credible basis for contending that the Beckjord project costs represent the cut-off point for routine and non-routine costs, showing that the individual Bull Run project costs were less than those at Beckjord Units 1-3 has little probative value.

Mr. Golden criticized Plaintiffs for failing to utilize his dollars-per-kilowatt convention to compare costs between different projects at different plants. That issue is a red herring. What is an impediment to evaluating costs in a fair and objective manner is Mr. Golden's arbitrary project aggregation rules, which lead to erroneous apples-to-oranges cost comparisons. When

one adopts Mr. Golden's dollars-per-kilowatt metric, but compares apples-to-apples, the costs of the projects in this case fall in line with other non-routine projects. For example, EPA found that just one of the Port Washington projects standing alone would not be considered routine (a \$500,000 air heater replacement). 1989 Clay Memo at 7 (pdf 8) (P-234) . Accordingly, when one compares the cost of the Bull Run economizer project with the economizer project at Port Washington (WEPCO) Unit 1 on a dollar-per-kilowatt basis, the cost differential is marginal. Doc. 208 at 27-44.

Finally, TVA compared the Bull Run project costs to the cost of a series of capital improvement projects performed throughout the TVA system. This comparison evidence, TVA's DX60 (Cap Projects Greater than \$100K) and DX61 (89-93 Un-ID Cap Proj List), reflects *capital improvement* projects which cost over \$100,000, but not routine maintenance projects. Consequentially, showing that there were some non-routine capital improvement projects²³ which cost more than \$100,000 does little to answer the question of whether the challenged project costs are comparable to costs of routine maintenance activities.²⁴

Furthermore, what is left out of the picture painted by DX60 (Cap Projects Greater than \$100K) and DX61 (89-93 Un-ID Cap Proj List) is how small a percentage the reported capital

²³ For the same reason, the work which TVA claims was categorized as "capitalized maintenance" would likewise not represent ordinary and regular maintenance. Doc. 204 at 196. Moreover, because the capitalized maintenance data presented to the Court was only reported in annual totals, it is impossible to evaluate the nature and extent of the projects covered by that hybrid classification to determine whether any of that work was comparable to routine maintenance.

²⁴ Clearly, some of the projects reflected in this data set are not maintenance, repair or replacement projects at all. See Cap Projects Greater than \$100K at 5 (DX60) ("Work Order #20004--10/01/89--Capitalized Spare Parts--\$412,867.46").

projects over \$100,000 represent when compared to the total number of routine maintenance activities that were likely performed throughout TVA's system. The data reflected on DX60 and DX61 span from 1969 to 1988 and includes roughly 2,000 projects over \$100,000 performed on 59 units. Doc. 201 at 42. If one conservatively assumes that a minimum of 5 routine maintenance activities costing less than \$100,000 are performed on a daily basis at all of TVA's units over the same 29 year period, projects like changing oil, repairing valves, inspecting equipment or calibrating instrumentation, and repairing tube leaks, then one would calculate a total of 3,122,575 routine maintenance projects being performed. If one further conservatively assumes that only 2,000,000 projects had been performed at TVA's plants over 29 years, then TVA's list of 2000 projects would constitute a tenth of one percent of all the projects performed. From that perspective, the costs of these projects is extraordinary.

In sum, for all the reasons discussed above and as the evidence presented at trial further demonstrates, this factor weighs against finding that the projects were routine maintenance.

E. Summary of Routine Maintenance Evidence

TVA has failed to meet its burden of proving that the economizer and secondary superheater projects were routine maintenance. The primary facts on which a routine maintenance determination must be made were never truly in dispute. To avoid the obvious conclusion which arises from an objective review of those facts, TVA was forced to ignore guidance from EPA and pertinent court decisions and attempt to redefine routine maintenance as something that was capable of encompassing all maintenance activities and virtually all capital improvement projects at coal-fired power plants. That approach, however, flies in the face of the narrow and limited construction of the exemption which must be applied to comport with

structure and intent of the Clean Air Act's PSD provisions and should be rejected. 1988 Clay Memo at 3 (DX54); *Alabama Power Co. v. Costle*, 636 F.2d 323, 400 (D.C. Cir. 1979).

As noted above, much of the testimony from TVA's Jerry Golden did not involve an analysis of the facts, but rather his characterization of the facts in light of his interpretation of law and guidance. TVA did not bring in a disinterested expert to do this analysis. Mr. Golden, as well as every other live witness presented by TVA, comes from the same small headquarters office responsible for environmental compliance decisions for all of TVA, such as whether to apply for a permit for these modifications. Were TVA to prevail on this issue, it would be personal vindication for them and their office.²⁵ In contrast, plaintiffs' witnesses on routine maintenance, Mr. Hekking and Mr. Freeman, also worked for TVA. They each had occasion to approve the implementation of major capital projects without PSD permits, so a victory by TVA would vindicate their past actions as well. Nevertheless, Mr. Hekking has acknowledged that once he reviewed the PSD rules carefully while at the Memphis-Shelby County Health Department's Air Pollution Control Department, he recognized that he "had violated the Clean Air Act." Doc. 202 at 61, a fact that no person is comfortable in admitting. Similarly, Mr. Freeman acknowledges that major projects like these were not routine maintenance. Plaintiffs' Deposition Designations, Doc. 188 at 19- 20. As plaintiffs have shown above, Mr. Freeman and Mr. Hekking are absolutely right; and TVA has not met its burden of proving that these projects fit within the RMRR exception.

²⁵ Similarly, a TVA victory here would vindicate the decision of Barry Stephens to refuse to even investigate whether TVA is violating the Clean Air Act, even though TDEC's sister agency, EPA, has found TVA liable for these very violations. Stephens Deposition Transcript, Doc. 129-6 at pdf pp. 46- 48.

IV. FAIR NOTICE

The only “fair notice” problem in this case is TVA’s failure to clearly state what its fair notice defense actually is. Sifting through the pleadings in this case, plaintiffs surmise that TVA has two complaints. First, TVA appears to claim that it did not have fair notice that an annual, not an hourly increase emissions was required for a modification. Doc. 134 at 46. Second, TVA contends it did not receive fair notice of the precise focus to be employed when conducting a four-factor routine maintenance analysis. *Id.* at 45. TVA asserts that the interpretations under which it is now being held liable were not created until 1999. *Id.* at 56. Given this assertion about timing, a fair notice argument is unreasonable. First, with respect to its emissions increase argument, as plaintiffs explained in Plaintiffs’ Brief in Opposition to TVA’s Motion for Summary Judgment, Doc. 144 at 56-57, on June 24, 1982, the Tennessee SIP changed, explicitly replacing a rule with an hourly increase test with a rule with an annual emissions increase test. *See Parties’ Stipulation Regarding Applicable Rules*, Doc. 187. As for the routine maintenance, the 1988 Clay Memo (DX54) is obviously of critical importance, and EPA issued it in 1988, not 1999.

1. Applicable Law

Plaintiffs set forth the applicable law regarding fair notice in their summary judgment briefing, Doc. 144 at 51-53, explaining that the key is whether “the [agency’s] interpretation is so far from a reasonable person’s understanding of the regulations that they could not have fairly informed [the defendant] of the agency’s perspective.” *Gen. Elec. Co. v. EPA*, 53 F.3d 1324, 1330 (D.C. Cir. 1995). In that briefing, which will not be repeated here, plaintiffs pointed out that timing plays an important role in analyzing the validity of a fair notice defense. See

United States v. Hoechst Celanese Corp., 128 F.3d 216, 224-30 (4th Cir. 1997) (holding that defendant did not have fair notice from 1984 until 1989, but did have fair notice from 1989 onward because EPA's regional office directly informed the defendant of its interpretation).

2. Emissions Increase

In its Order on Summary Judgment, the Court thoroughly discussed the fair notice issue with respect to the emissions increase test, noting that a 1981 memo from Ed Reich was not a basis for concluding that there was a fair notice problem. *See* Order on Summary Judgment, Doc. 170 at 31. Other than that, TVA has presented no contemporaneous interpretations or applicability determinations from either EPA or TDEC that an hourly increase test was required for PSD modifications after June 24, 1982. TVA appears to rely on the testimony of Mr. Golden, Mr. Park, and Mr. Stevens that their understanding was that an hourly test applied, but none of them actually point to rule language to support their “understanding.” Given the plain language of the rule, *see* Order on Summary Judgment, Doc. 170, the explicit change in the rule discussed above, and the absence of any contemporaneous documentation supporting its position, the “misunderstanding” of TVA's witnesses is hardly the basis for a fair notice defense.

TVA may also be raising a new wrinkle on its fair notice defense; namely that if the Court is applying the actual-to-projected actual test, there is a fair notice problem because in their view, the language of the rule does not support it. This argument is absurd. EPA was absolutely clear in the Clay Memo that it believed that the correct test for determining emissions increase was the actual-to-potential test. 1988 Clay Memo at 7 (DX54). Now TVA is arguing that an emissions increase test which is far more favorable to TVA than to plaintiffs should not be used to determine liability because the rule language and EPA's explicit position supports the use of

the more rigorous test. In any event, review of the Clay Memo shows that industry was able to read the regulations as supporting the projected actual test: “The WEPCO also contends that EPA should instead compare representative actual emissions prior to the change with “projected” actual emissions after the renovations.” *Id.* at 7, n. 4. Although EPA rejected this test at the time, WEPCO’s argument proves that industry could readily ascertain that an actual-to-projected future actual test was potentially applicable for determining emission increases prior to the issuance of the 1988 Clay Memo (DX54).

3. Routine Maintenance

TVA’s argument regarding fair notice with respect to the routine maintenance defense is moot. The Court has ruled that in evaluating routine maintenance, it will use the *East Kentucky* standard and to evaluate each of the four factors from the perspective of the industry as a whole, as well as at the unit. Order on Summary Judgment, Doc. 170 at 17; Doc. 202 at 117-119; *E. Ky. Power Coop., Inc.*, 498 F. Supp. 2d at 994; *Cinergy Corp.*, 495 F. Supp. 2d at 930. Because the Court is taking into account the test which TVA says was essential to consider, TVA has no basis for complaining on fair notice grounds about any subtle distinctions in how the Court articulates and applies the routine maintenance test or precisely how the four relevant factors are weighed.²⁶

To the extent TVA is still asserting the defense, TVA has failed to carry its burden. It has been unable to point to any relevant document created by EPA, either before or after the 1988 projects, which could have objectively been read as indicating routine maintenance exemption

²⁶ It may be that TVA conceded this point in its opening. Doc. 202 at 29-30 (noting lack of quarrel with four factor test).

was judged exclusively by evaluating what has transpired in the industry as a whole. *See generally SIGECO*, 245 F. Supp. 2d at 1011-13 (*citing Hoechst Celanese Corp.*, 128 F.3d at 224-30). Similarly, TVA failed to show that any of the documents it presented to address this issue were considered by anyone at TVA before the challenged projects were undertaken. For example, although TDEC's Barry Stephens' claimed TDEC has long held the belief that routine maintenance was determined by assessing "whether similar projects have been conducted at other sources in the same industrial category," Stephens Decl., Doc. 129-2 at 8 ¶ 18, Stephens was unable to produce any documentation or applicability determinations supporting that position. Stephens Depo Testimony, Doc. 190 at pdf 23-24. Furthermore, TVA presented no evidence that TDEC's alleged interpretation was ever conveyed to TVA. Finally, although TVA did present some general testimony from Mr. Golden and Mr. Park about what TVA and the industry's purported understanding was so far as the routine maintenance exemption was concerned, Doc. 201 at 8-21; Doc. 208 at 119-122, TVA failed to produce any TVA documents from the pre-1988 time period which reflect its position that routine maintenance must be evaluated exclusively from an industry-wide perspective. Such shortcomings are fatal to TVA's fair notice defense.

If, for the sake of argument, one goes through a fair notice analysis with regard to this first issue, the first thing that becomes evident is that one of the critical time periods for assessing TVA's defense is the period up to 1988 when TVA performed the projects. *See Southern Indiana Gas*, 245 F. Supp. 2d at 1013, 1021 (discounting a non-applicability determination that occurred after the modification in question); *Cinergy*, 495 F. Supp. 2d at 904 n. 9 (finding materials generated after the construction project to be irrelevant to the fair notice inquiry);

Hoechst Celanese Corp., 128 F.3d at 224-30. Any document created after 1988 would appear to be irrelevant, at least so far as documents supporting TVA's case are concerned.²⁷

If the documents created after 1988 are set aside, then at least three things should still have put TVA on notice that its conduct in modifying the Bull Run Plant may have put it at risk of violating the PSD provisions of the Clean Air Act. The first is the *Alabama Power* decision issued in 1980, which should have informed TVA that the term "modification" was extremely broad and could be viewed as encompassing even the most minuscule tasks at a plant. *Alabama Power*, 636 F.2d at 400 ("the term 'modification' is nowhere limited to physical changes exceeding a certain magnitude."). Equally as important, the *Alabama Power* decision should have informed TVA that EPA did not have authority to create exemptions beyond those that compelled by administrative necessary or only applicable in *de minimis* circumstances. *Id.* at 358-60.

Second, the use of the word "routine" in the regulations raises the red flag. The word is something which ordinary people can readily understand and ascertain. Doc. 203 at 162. Any reasonable person apprised of the relevant facts would recognize that the projects at issue here ran a substantial risk of not being considered routine. Accordingly, as the Court pointed out in its Order on Summary Judgment, at a minimum, TVA should have sought an applicability determination. Order on Summary Judgment, Doc. 170 at 33.

²⁷ This would include both the Government Accounting Office's Report from 1990, entitled "*Electricity Supply: Older Plants' Impacts Reliability and Air Quality*, (Sept. 1990) ("GAO Report") at 30-3 (DX58), and what has been referred to as the Letter from William G. Rosenberg, EPA. to Chairman John D. Dingell, House of Representatives (June 19, 1991) ("1991 Dingell Letter") (DX57). And like Mr. Stephens' declaration, neither of these documents actually sets forth any interpretation of the routine maintenance exemption. *SIGECO* 245 F. Supp.2d at 1019-20

Third, the Cyprus Casa Grande applicability determination (P-235), which was issued on November 6, 1987, provided the world with fair notice that when EPA evaluated the routine maintenance exemption, it focused almost exclusively on the specific unit in question, as the following excerpt illustrates.

Under the PSD definition of “major modification”, a physical change does not include “routine maintenance, repair and replacement.” 40 C.F.R. § 52.21(a)(2)(iii)(a). Although the E & CI report notes the good condition of the acid plant and characterizes some of the needed work as “minor” or “moderate,” viewed as a whole, the minimum necessary rehabilitation effort is extensive, involving replacement of key pieces of equipment (e.g., the CCD thickener tanks, pumps, external insulation, and substantive time and cost. In an operating plant some of the individual items of the planned rehabilitation, e.g., painting, **if performed regularly as part of standard maintenance procedure** while the plant was functioning or in full working order, could be considered routine. Here, however, this and other numerous items of repair, as well as replacement and installation of new equipment, are needed in order for the RLA plant to begin operation. The fact that the plant requires four months of extensive rehabilitation work despite the adequate maintenance Noranda claims to have undertaken during the shutdown underscores the non-routine nature of the physical change that will occur at the plant. This, given the extent and nature of the repair, rebuilding and replacement of important equipment necessary to make the RLA plant operational, the rehabilitation work simply cannot be considered the “routine maintenance, repair and replacement” which is excluded from PSD review.

Id. at 6 (emphasis added). In the context of this applicability determination, EPA’s focus on the unit in question and the obvious lack of an assessment of what had transpired within the industry as a whole provided ample notice that EPA deemed unit-specific considerations to be a significant factors to assess in any routine maintenance analysis. After Cyprus Casa Grande, a reasonable person could neither fail to recognize that EPA did not assess routine maintenance exclusively with regard to the what has transpired in the industry as a whole, nor miss EPA’s focus on “regular” actions taken “as part of a standard maintenance procedure.” *See generally Cinergy*, 495 F. Supp. 2d at 902-03. It was likewise clear to anyone who reviewed that

applicability determination that the Bull Run projects risked being considered non-routine. This evidence is more than sufficient to defeat TVA's fair notice defense concerning the "within the industry" standard.

4. TVA Has Received Actual Notice

As the Sixth Circuit made clear, it is TVA's current operation without a BACT emission limit and without a PSD permit that are the violations alleged in this case. *National Parks Conservation Ass'n, Inc. v. Tennessee Valley Authority*, 480 F.3d 410, 418-19 (6th Cir. 2007). EPA gave TVA actual notice regarding these very violations through the Environmental Appeals Board decision filed on September 15, 2000. *See In re Tennessee Valley Authority*, 2000 WL 1358648, 9 E.A.D. 357 (EPA ALJ Sep 15, 2000), motion to dismiss denied by, *TVA v. United States EPA*, 278 F.3d 1184 (11th Cir. 2002), *opinion withdrawn in part by*, *Tennessee Valley Authority v. Whitman*, 336 F.3d 1236 (11th Cir. 2003), *cert. denied*, 541 U.S. 1030, 124 S. Ct. 2096 (2004). At that point, TVA could have applied to TDEC for a PSD permit with BACT emission limits but chose not to do so. The plaintiffs did not send their first notice letter until over a month later (October 30, 2000). Thus, TVA has not only had fair notice, it has had actual notice. *See Hoechst Celanese Corp.*, 128 F.3d at 224-30 (holding that defendant did not have fair notice from 1984 until 1989, but did have fair notice from 1989 onward because EPA's regional office directly informed the defendant of its interpretation).

For all the reasons addressed above and as demonstrated by the evidence presented at trial, TVA has failed to prove any fair notice defense.

V. CONCLUSION

For the reasons set forth above, the Court should find that TVA is liable for the violations alleged in the complaint.

Respectfully submitted this 31st day of August, 2009

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CERTIFICATE OF SERVICE

I hereby certify that on August 31, 2009, I electronically filed the foregoing document with the Clerk of the Court using the CM/ECF system which will send notification of such filing by operation of the Court's electronic filing system to the following:

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